<u>Claims</u>

What is claimed is:

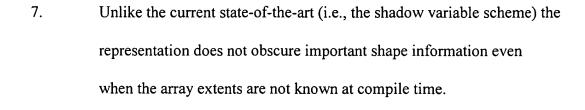
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- 1. A method and process for array shape inferencing for an array-based language-such as MATLAB.
- 2. The method enables a compact representation of shape at compile time.
- 3. The highlights of the method are its generality and uniformity.
- 4. The representation facilitates program-wide shape inferencing by forward composing the individual shape-tuples.
- 5. The representation does not depend upon any compile-time overestimate of shape.
- 6. The representation exactly captures the shape that the MATLAB expression assumes at run time, even when program variables may be unknown at compile time.

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- The framework exposes useful algebraic properties that underlie
 MATLAB's shape semantics.
- 9. The methodology of claim 8, wherein the algebraic properties can be used for various compile-time optimizations such as reducing array conformability checking and allocating memory in advance.

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